

ABSTRACT OF THE DISCLOSURE

A method for repairing defects in a photolithographic mask for use in patterning semiconductor wafers introduces a pre-selected phase error selected to sum with a phase error of a defect repair material, yielding a desired composite phase error relative to light passing through the substrate alone, e.g., 180° . Substrate phase error may be introduced by modifying its thickness. For example, after any opaque layer material within a repair zone surrounding the defect is removed, the substrate, too, is removed within the repair zone to a pre-selected depth, forming a lacuna. Repair material is then deposited in the lacuna and in the remainder of the repair zone to a level substantially equal to the top surface of the opaque layer, yielding a desired, combined phase error and attenuation matching those of defect free regions of the mask where the opaque layer has not been removed.